Metallic ion sensing with a benzothiazole-based fluorimetric chemosensor

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The recognition of metallic ions has been given great attention due to their important roles in many biological and environmental processes. The use of fluorimetry in the qualitative and quantitative determination of such species is considered as one of the most effective analytical method for biomedical and environmental monitoring, allowing fast and sensitive detection, usually with low detection limits which are particularly suitable for dilute media [1].

In this communication, we report the chemosensory ability study of a benzothiazole unit coupled to an amino acid core. This ensemble can be considered an unnatural amino acid derivative, which can act as building block for intrinsically-labelled fluorescent peptides [2]. Benzothiazoles are known for displaying high relative fluorescence quantum yields and the fine tuning of the optical properties can be achieved by adequate substituent choice at selected positions of the heterocyclic ring [3].

The evaluation of the unnatural amino acid as a fluorimetric chemosensor was carried out by performing titrations in acetonitrile and acetonitrile/water in the presence of relevant alkaline, alkaline-earth and transition metal cations. It was found that the tested compound had a remarkable fluorimetric response in the presence of Cu^{2+} in acetonitrile and in the presence of Fe^{3+} in acetonitrile/water (9:1).

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